

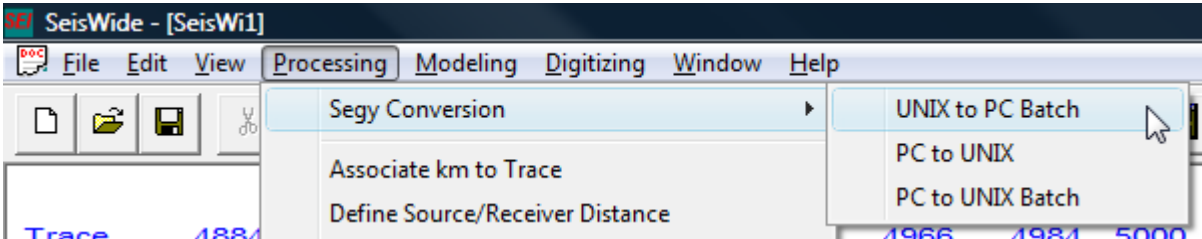
## Plotting Wide Angle Seismic Data on a Windows Computer with SeisWide

This free program is available from Dalhousie University:

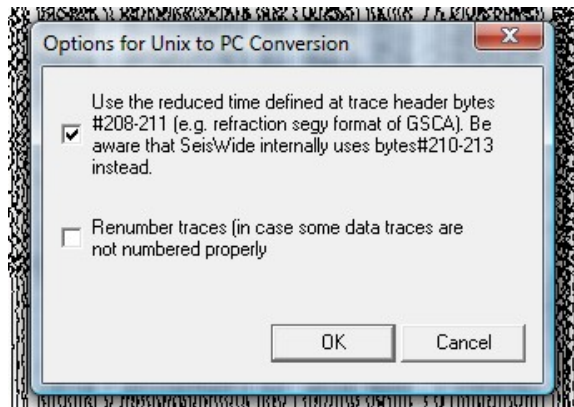
<http://seismic.ocean.dal.ca/utilities/seiswide/index.php>

I tested it on the data I analysed for my MSc, the [PACE 1989](#) wide angle refraction survey which I requested from [IRIS](#) and subsequently downloaded from a custom link they sent me.

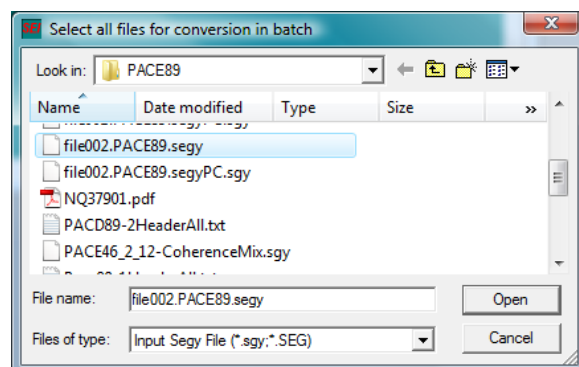
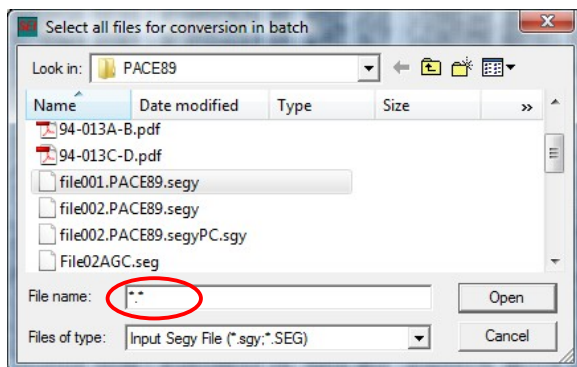
To load the SEGY data from IRIS (it was in standard SEGY format, IBM 32-bit floating point values):



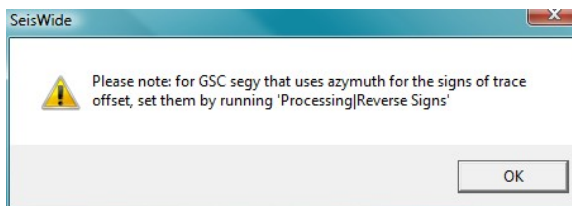
Next select this option (the traces of this wide angle seismic were reduced at 8 km/s)



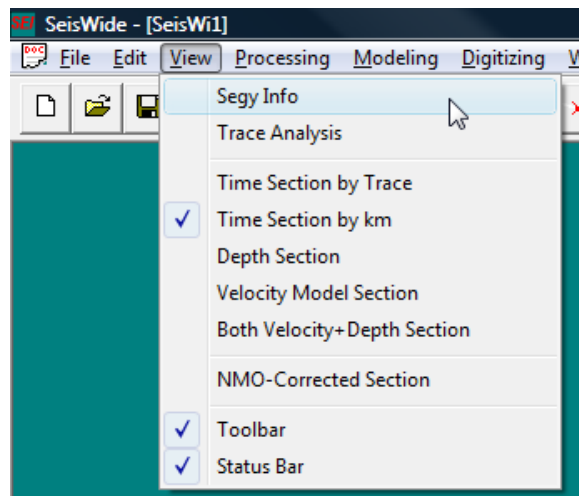
Next, you will have to browse to the SEGY data file. You will need to put \*.\* so you can see all files, then select the file and click Open



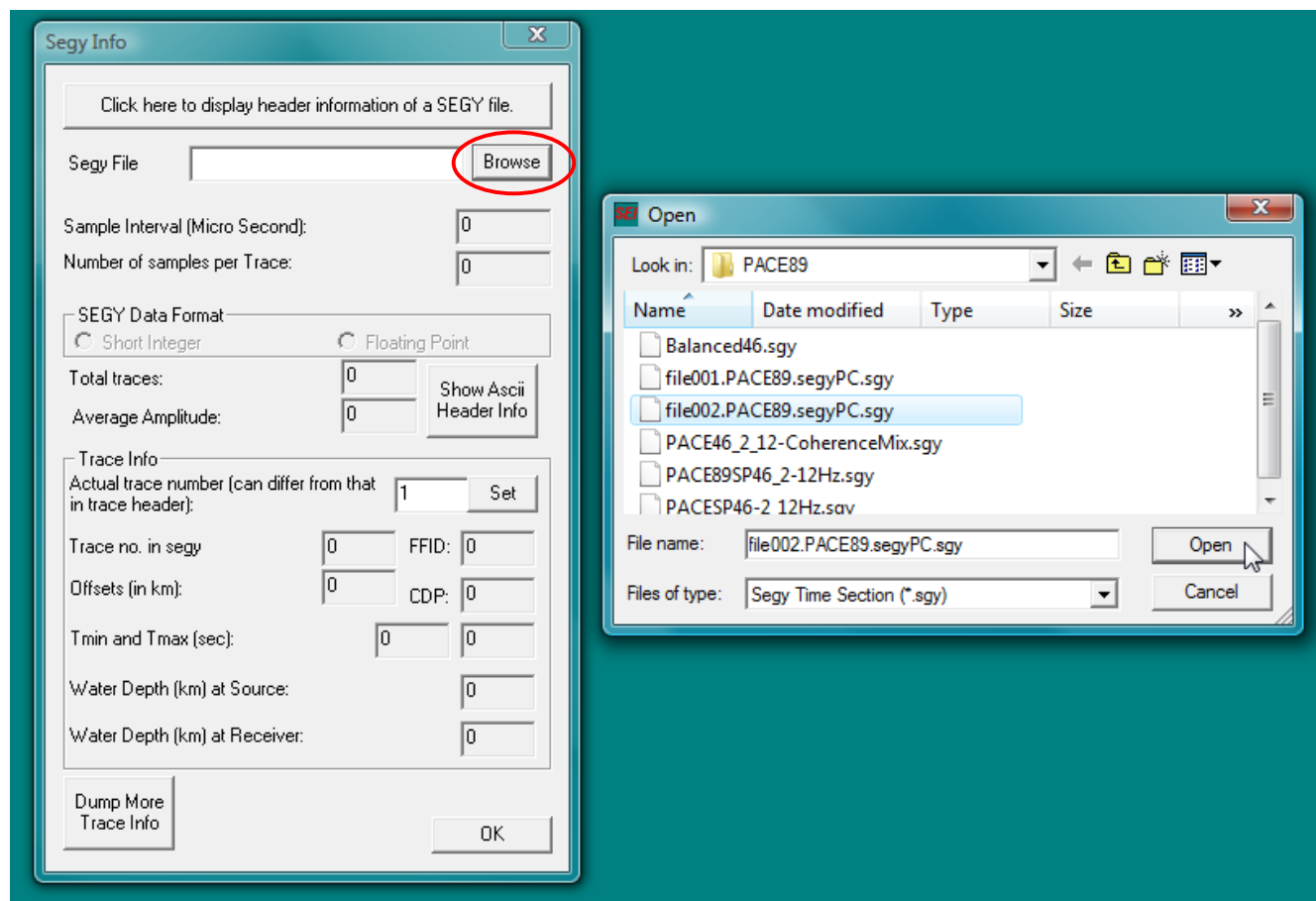
It finishes with this popup, click OK  
We now have a PC SEGY file which  
was converted from the Unix SEGY  
file I downloaded from IRIS



Next, we'll take a look at the SEGY header information



Click Browse, to select the PC SEGY we just created. Select the file and click OPEN



Segy Info

Click here to display header information of a SEG Y file.

Segy File  Browse

Sample Interval (Micro Second):

Number of samples per Trace:

SEG Y Data Format

☐ Short Integer ☒ Floating Point

Total traces:  Show Ascii Header Info

Average Amplitude:

Trace Info

Actual trace number (can differ from that in trace header):  Set

Trace no. in segy  FFID:

Offsets (in km):  CDP:

Tmin and Tmax (sec):

Water Depth (km) at Source:

Water Depth (km) at Receiver:

Dump More Trace Info

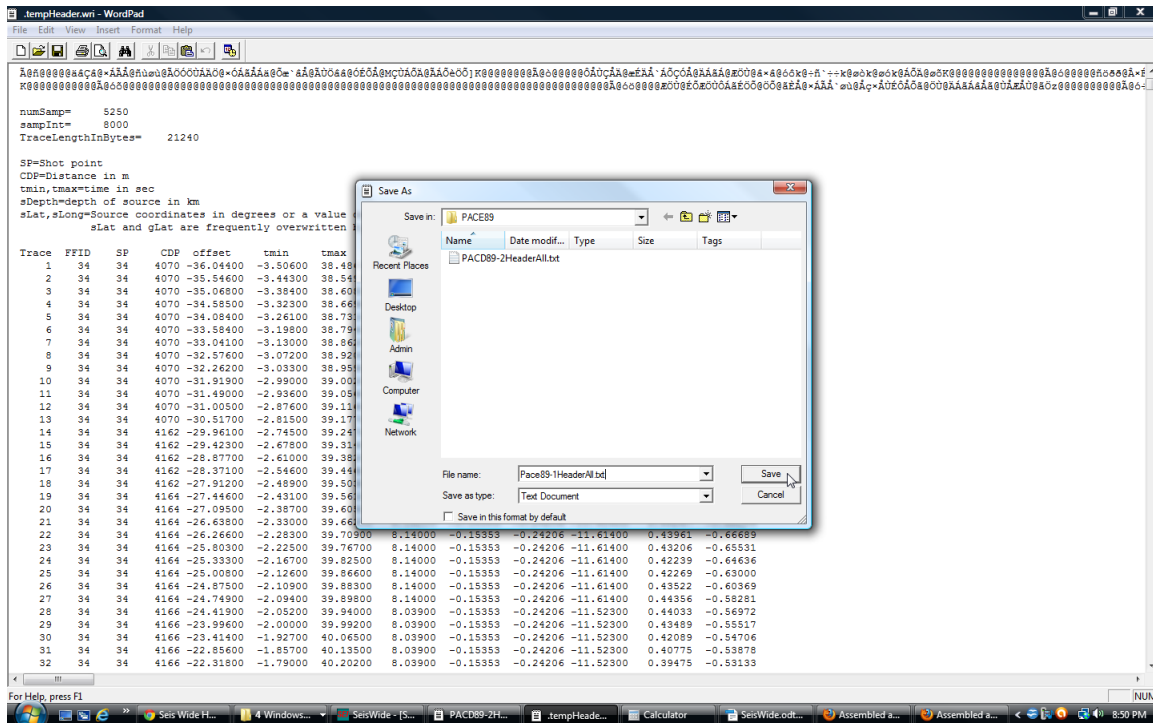
OK

You will now get this dialog

You can change the trace and click Set to view the trace header information for that particular trace

More useful is to dump all the trace information to a text file by clicking on the Dump More Trace Info button

A textfile with the header information pops up in Wordpad. Save the file to an appropriate place:

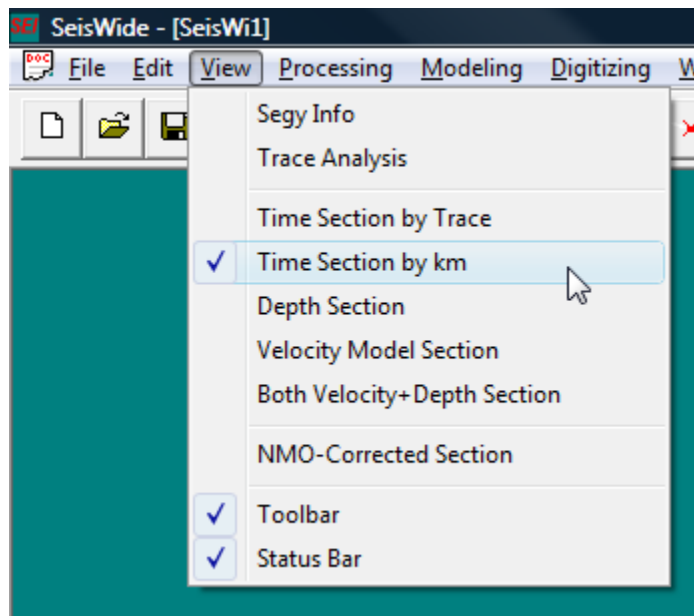


Notice that it shows which shot point is associated with each trace as well as the source-receiver offset for each trace. We will need this information to properly display the data a shotpoint at a time.

I want to display only shot point 46 from the entire set of 9515 traces in the data set. From the above header file, I determine the following information:

- SP 46 first is 4834, offset is -244.78201 km
- SP 46 last trace is 5237, offset is -88.71500 km

Next, we will display the data:



Fill in the appropriate information based upon the header information

SP 46 first is 4834, offset is -244.78201 km

SP 46 last trace is 5237, offset is -88.71500 km

Combined Parameter List

Common Parameters | Time or Depth Sections

Title of plot: PACE89 SP 46

Trace1, Trace2, Step: 4884 5237 1

Xmin, Xmax, XTick: -230 -85 20

Gain, Clip, Min.Amp: 0.25 10 0.01

Display Methods:

☐ Wiggle ☐ Area ☒ Wiggle+Area ☐ Color ☐ Wiggle+Color

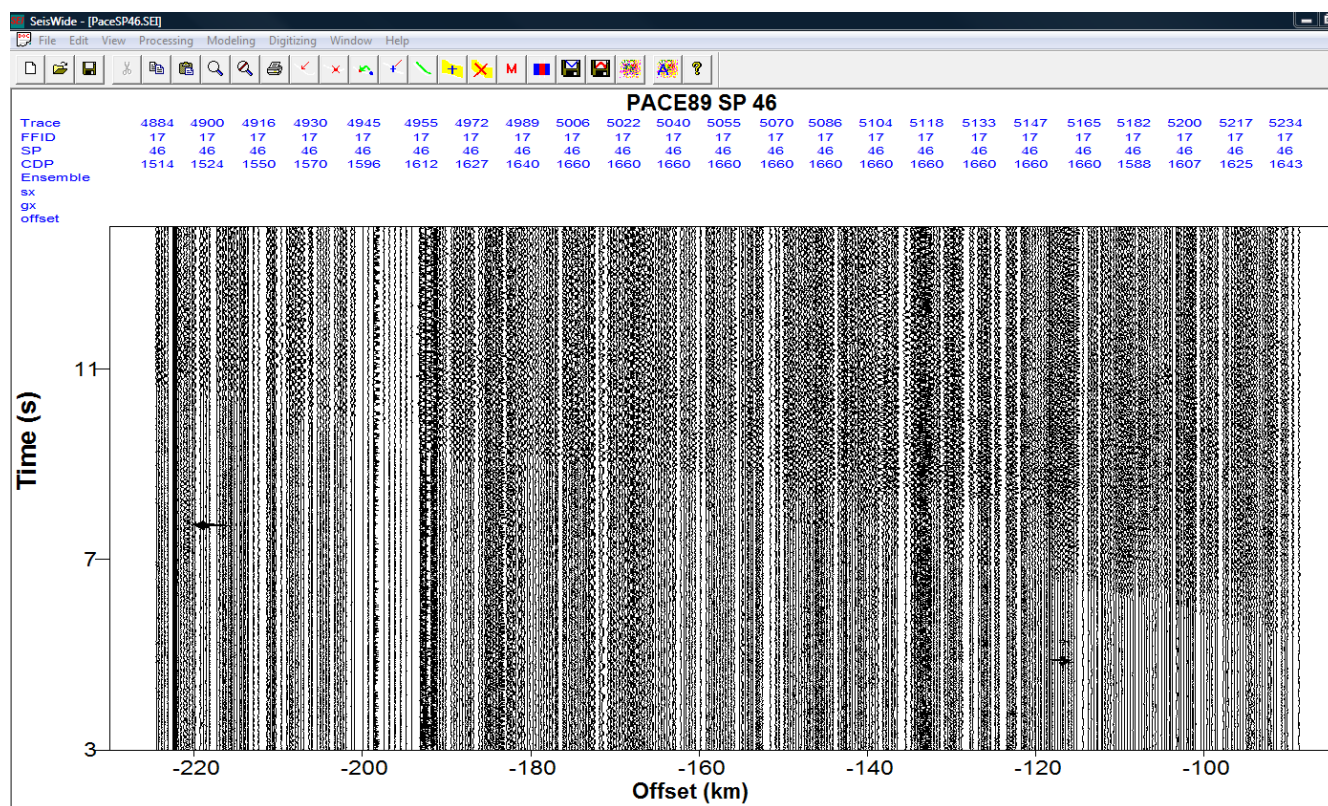
Face Down or Up

☐ Face down ☒ Face Up

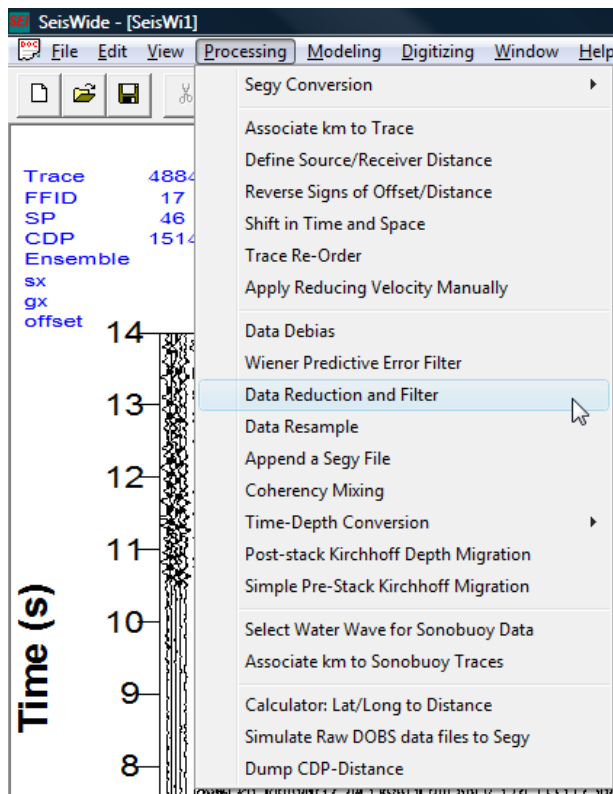
☐ Distance/Offset increases monotonically with trace (check to speed up loading)

OK Cancel Apply Help

The seismic data I analysed in grad school is now correctly plotted on the screen!



This software also lets you do some processing. I applied a band pass filter from 2-12 Hz to the data:



**Trace Re-Shape and Filter**

Input File Name:

Output File name:

Trace1, Trace2, TraceStep:

☒ Stop processing when a trace number > Trace2

Tmin, Tmax, VRed:

☐ 3-Point Recursive Filter in Time Domain (Causal & Very Mild)

☐ Check to apply filter at freq (hz):

☒ Frequency Filter (Non-Causal But Cut Freq Precisely)

☒ Check to apply filter:

These are filter freq in Hz: cut, min, max and cut. Cosine function (Hann Window) will be used for each side.

☐ Spherical Dispersion Compensation

☐ Check to multiply by time to the order of:

☐ Trace Normalization

☐ Check to normalize the maximum amplitude of each trace to:

☐ Manual Trace Scale

☐ Check to multiply the amplitude of each sample by:

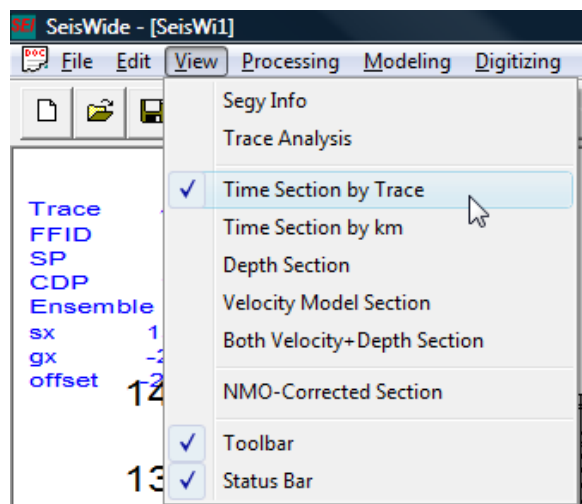
Note: Output will always be in floating point format.

You will need to select the input file (in this case the PC SEGY file we created) and an output file name.

The traces from the shot are selected

These are the bandpass filter parameters. I left the default because this is deep crustal seismic data which is lower in frequency than shallower industry type reflection type seismic data. Make sure you check off the check box!

I found I had to go to View, TimeSection by Trace to select the processed SEGY file, then View, Time Section by Km to get the final plot (a slight quirk).



**View Section Trace by Trace**

Title of plot:

File name for time section:

Trace1, Trace2, Step:

Tmin, Tmax, TTick:

Trace Header Infor to Display:

Gain, Clip, MinAmp:

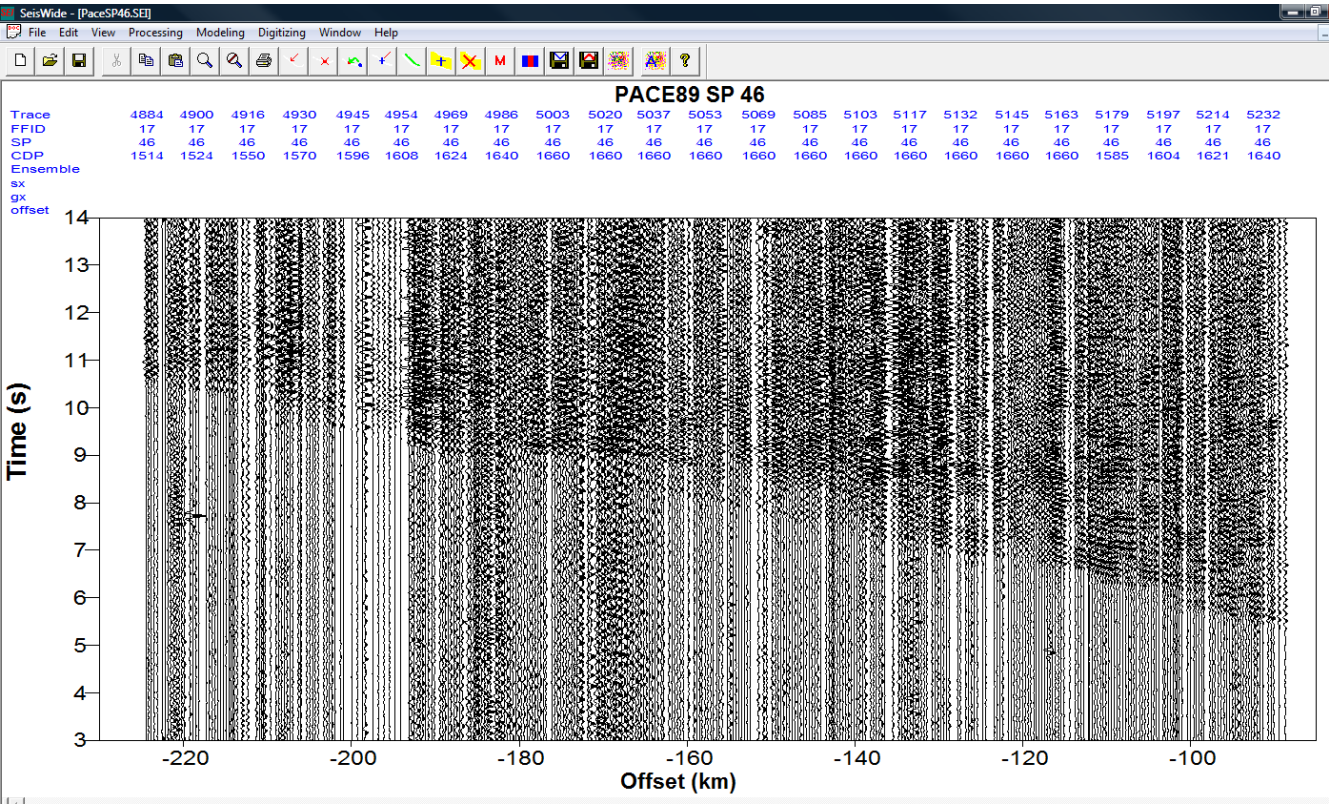
Display Methods:  
☐ Wiggle ☐ Area ☒ Wiggle+Area ☐ Color ☐ Wiggle+Color

Face Down or Up:  
☐ Face down ☒ Face Up

☐ Reset starting time to (ms) (Caution: This changes trace headers; Check only if trace start time is surely wrong):



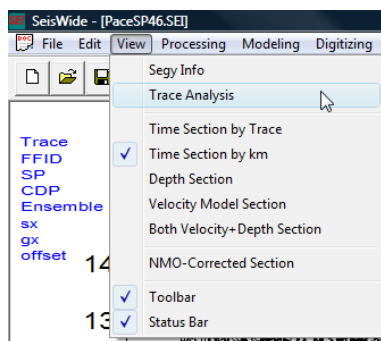
You will notice that this processed plot has lower frequency events (2-12 Hz) only:



Wow! What I did in grad school can now be easily done on a PC. This software will run off a network drive. It does not need to be installed.



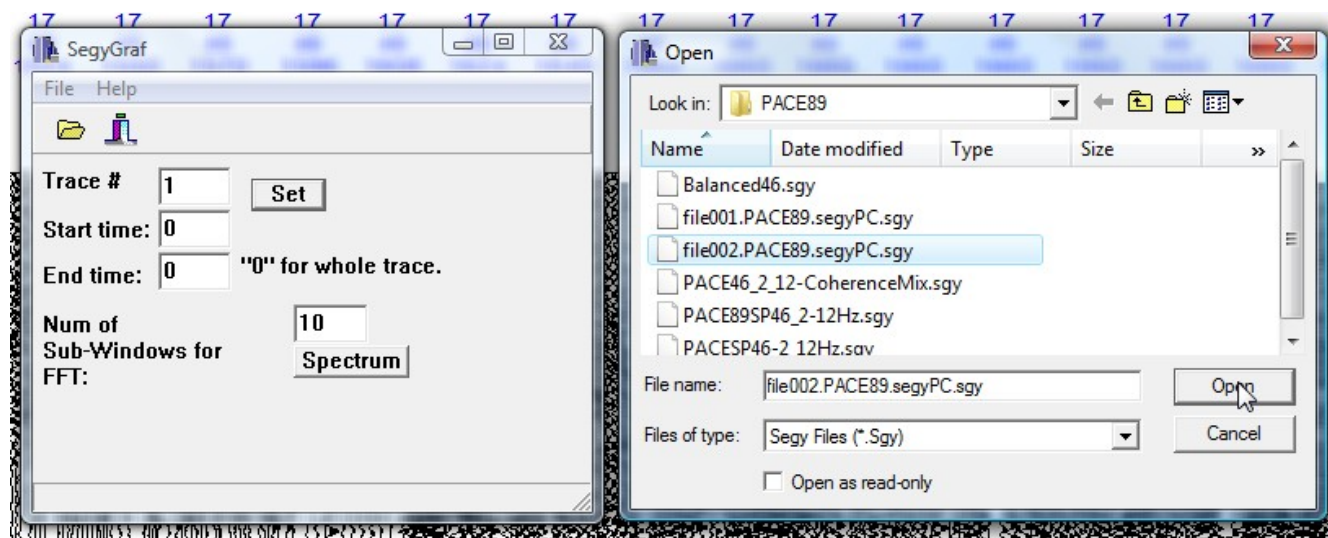
You can do spectral analysis of individual traces:



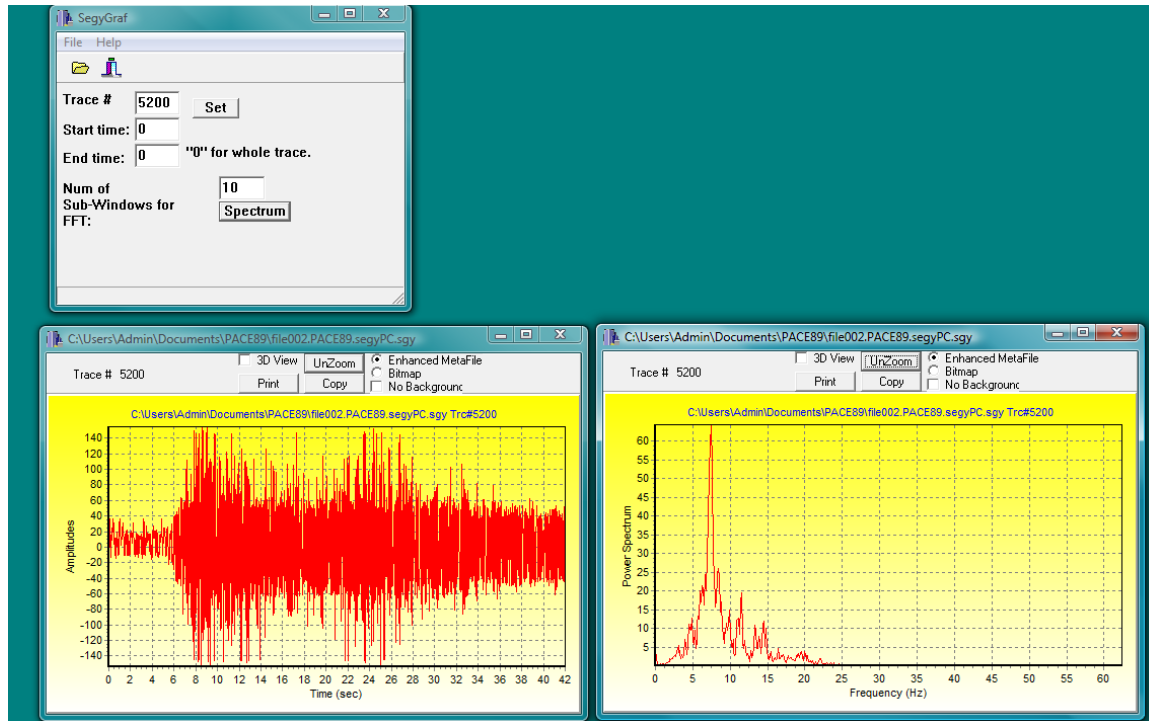
This will show SegyGraf in a small window. Select File Open from the menu to Open a SEGY file



Browse to the file and click Open:



I've chosen trace 5200 (which was in shot point 46), *click set*, then *click spectrum*. The seismic trace plotted amplitude versus time will be displayed along with the frequency spectrum of the trace (this was the unprocessed original data I looked at). As expected, the data is mainly in the lower frequency spectrum since we are looking at deeper seismic events.



## Seismic Data from Saskatchewan

Lithoprobe Trans-Hudson Orogeny Trasect ([THOT](http://gdr.nrcan.gc.ca/seismtlitho/archive/thot/stacks_e.php))

[http://gdr.nrcan.gc.ca/seismtlitho/archive/thot/stacks\\_e.php](http://gdr.nrcan.gc.ca/seismtlitho/archive/thot/stacks_e.php)